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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/040,797	01/07/2002	Neil J. Goldfine	1884.1015-006	3789

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EXAMINER	
WEST, JEFFREY R	
ART UNIT	PAPER NUMBER
2857	

DATE MAILED: 07/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application N .	Applicant(s)
	10/040,797	GOLDFINE ET AL.
	Examiner	Art Unit
	Jeffrey R. West	2857

-- Th MAILING DATE of this communication appears on th cover sheet with th correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 April 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) *22-25,28 and 29* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21,26 and 27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 January 2002* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Pri rity under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Information Disclosure Statement

1. The Non-Patent Literature references cited on the Information Disclosure Statement, filed 08 February 2002, have not been considered because copies of these references have not been provided and were not present in the parent application file.

Drawings

2. The drawings are objected to because they do not have sufficiently descriptive labels. Blank boxes in drawings should be labeled descriptively unless it is a well-known component. Therefore, in Figure 18B, box "130" should be labeled "switching device" as it is defined on page 27, line 25.

Specification

3. The disclosure is objected to because of the following informalities:

On page 12, line 1, the "sensor" is incorrectly labeled "36" instead of "86" as it is defined on page 12, line 1 and in Figure 4.

On page 27, line 25, the "sensor" is incorrectly labeled "122" instead of "120" as it is defined on page 26, line 27 and in Figure 18B.

Appropriate correction is required.

Claim Objections

4. Claims 1, 2, and 11 are objected to because of the following informalities:

In claim 1, “a model to compute and input/output terminal relation value” should be ---a model to compute an input/output terminal relation value---.

In claim 2, “A method as claimed in Claim 1 where the additional step is added of f)” should be ---A method as claimed in Claim 1 where an additional step is added of f)---.

In claim 11, to be in accordance with the language of the previous claims, “parameters in b) and c)” should be ---parameters in steps b) and c)---.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> **The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.**

6. Claims 2, 9, and 12-14 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 2 recites a limitation for determining properties as “mappings between measurement and property spaces” but fails to provide a description of this step in

the specification. Therefore, it is unclear to one having ordinary skill in the art as to the definition of "property spaces" as well as how to make/use this particular limitation in accordance with the remainer of the claimed invention.

Claim 9 specifies that the "magnitude-magnitude grids are for measurements on substantially nonconducting media." However, nowhere in the specification is there a description of this limitation. Further, there is no definition of "substantially nonconducting media" or how this type of media is used in accordance with the remainder of the claimed invention. Therefore, it is unclear to one having ordinary skill in the art how to make/use this aspect of the invention.

Claims 12-14 are rejected under 35 U.S.C. 112, first paragraph, because they incorporate the lack of enablement present in parent claim 2.

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> **The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.**

8. Claims 1-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite because it recites, "defining operating point parameters and an electrode geometry, electrode configuration . . ." Since claim 1 earlier recites defining properties for a

material, it is unclear to one having ordinary skill in the art whether these operating point parameters are parameters of the material or the electrode.

Claims 3-5 are rejected as being vague and indefinite because they refer to "parts" b) and/or c) while there is no mention of any previous "parts" in the parent claims. It is suggested that the limitation of "parts" be changed to "steps."

Claim 5 is rejected as being vague and indefinite because it recites, "wherein one of the operating point materials in parts b) and c) is a variable liquid of unknown properties" while there is no previous mention of any "operating point material" in parent claim 1. Further, since claim 1 provides limitations for inputting values (i.e. parameters) it is unclear how one would also provide materials as described in claim 5.

Claim 9 is rejected under 35 U.S.C. 112, second paragraph, because it recites, "where the magnitude-magnitude grids" while there is no previous mention of any "magnitude-magnitude grid" the respective parent claims. It is suggested that in claim 8 Applicant define the description as a magnitude-magnitude grid.

Claims 2, 6-8, and 10-17 are rejected under 35 U.S.C. 112, second paragraph, because they incorporate the indefinite language present in their respective parent claims.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 1, 3, 6-8, 10, 15, 16, 18-21, 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,453,689 to Goldfine et al. in view of Zaretsky et al., "Continuum Properties from Interdigital Electrode Dielectrometry".

Goldfine discloses apparatus, devices, methods, and techniques for non-contact measurement of physical and kinematic properties of a material under test comprising, in one embodiment, an electromagnetic structure capable of imposing an electric field in the material under test when driven by an electrical signal and sensing an electromagnetic response, an analyzer for applying an electric signal to the electromagnetic structure and sensing the response, and a property estimator for translating the sensed response into estimates of one or more pre-selected properties of the material (column 6, lines 21-57). Goldfine discloses defining a dynamic range and property estimate tolerance requirements for pre-selected properties of the material under test, geometric and configuration properties for an electromagnetic apparatus, and a continuum model for generating property estimation grids for the pre-selected material properties as well as operating point response curves for pre-selected operating point parameters (column 6, line 58 to column 7, line 2). Goldfine discloses analyzing the grids and curves using a sensed electromagnetic response at each operating point, and performing property

estimation over the defined range using the estimation grids and operation curves (column 7, lines 3-17). Goldfine discloses using the grids and operation curves to optimize the operating parameter points, and sensor and material structures (column 25, lines 34-52).

In another embodiment, Goldfine discloses defining physical and geometric properties for a material under test including pre-selected properties of the material under test (column 7, lines 24-26), such as physical, geometrical, and dimensional properties (column 13, lines 9-10). Goldfine discloses defining operating point parameters and geometric properties for the magnetometer (column 7, lines 26-28) and applying all the parameters/values into a model to compute an input/output terminal relation value that is a response value of transimpedance magnitude and phase. Goldfine discloses recording the terminal relation value and repeating the process after incrementing the pre-selected properties of the material under test and repeating this process until desired conditions are met at which time the terminal relation values are plotted to form a multidimensional magnitude-phase property estimation grid (column 7, lines 29-37, column 9, lines 56-59, and Figure 29). Goldfine also discloses plotting these magnitude and phase values with a non-dielectric determined value of foil thickness (i.e. delta) (Figure 29). Further, although Goldfine doesn't specifically disclose a database for storing the terminal relation value as a property estimation grid point, it is considered inherent that in order for the method to plot a plurality of terminal relation values obtained over time in an

estimation grid, there must be some storage medium/database for saving the values until they are plotted.

Goldfine also discloses performing the aforementioned steps as well as adjusting the pre-selected property of the material under test to compute another terminal relation value and corresponding Jacobian elements, defined as the variation in a terminal relation value due to variation in the pre-selected material property (column 7, lines 47-55), computing a singular value decomposition for the Jacobian elements to obtain singular values, singular vectors, and condition number of the Jacobian elements (column 7, lines 56-63) to evaluate the sensitivity, selectivity, and dynamic range of the magnetometer and operating point parameters, and adjusting the magnetometer model values and repeating the process until desired estimates are achieved (column 7, lines 59-67).

Goldfine also discloses choosing the model operation based upon the range of the excitation frequency and therefore it is considered inherent that this parameter must first be defined before being inputted into the model to allow proper model selection (column 6, lines 35-57).

With respect to claims 7 and 8, Goldfine also discloses plotting the magnitudes at the same wavelength, or as a function of multiple wavelengths (column 18, lines 23-34).

With respect to claim 13, Goldfine discloses using the singular values, singular vectors, and condition numbers to obtain property estimates and also discloses

storing these values used to calculate the property estimates with grid points for interpolation (column 17, lines 3-9).

With respect to claims 19, 26, and 27, Goldfine specifies that the property estimator is coupled to the magnetometer to translate the sensed electromagnetic responses into estimates of one or more pre-selected properties of the material (column 4, lines 13-21) and, as noted above with respect to the description of the continuum model, successively increments the properties, each time measuring new parameters for new estimation grids, in order to determine optimized values.

With respect to claim 20, Goldfine also disclosed that the previous embodiments may be implemented using a response translated into proximity (i.e. lift off) estimates which are then used in accordance with the model/estimation grids, as noted above (column 4, line 62 to column 5, line 10).

As described above, Goldfine teaches many of the features of the claimed invention. Goldfine also teaches that these apparatus and methods are for use in either magnetometer or dielectrometer applications depending on the range of the excitation frequency (column 6, lines 35-57). Goldfine, however, does not teach a corresponding structure specific to the dielectric operation or the corresponding defined parameters required for dielectric property estimation (i.e. electrode parameters).

Zaretsky teaches a modal apparatus for deriving a model that makes an interdigital electro microdielectrometer applicable to measuring continuum parameters in a wide range of heterogeneous media comprising defining pre-

selected electrical properties of a material (i.e. surface capacitance density), wherein the surface capacitance density also defines all the heterogeneity and structure of the substrate medium (i.e. physical/geometric properties), and electrode geometry and configuration (i.e. electrode structure and spacing) (page 900, column 1, paragraph 2). Zaretsky teaches inputting these defined properties/configuration data into a model to compute an input/output terminal response/relation value (page 900, column 2, paragraph 1). Zaretsky also teaches using these values to determine phase grids/graphs based upon the model output (page 906) and also specifies a material for testing as a viscous curable epoxy (page 899, column 2, paragraph 2).

It would have been obvious to one having ordinary skill in the art to modify the invention of Goldfine to include a corresponding structure specific to the dielectric operation and the corresponding defined parameters required for dielectric property estimation (i.e. electrode parameters), as taught by Zaretsky, because Goldfine teaches use of the method and apparatus for sensing properties outside the range of normal magnetometers and dielectrometers (column 6, lines 10-21) and suggests that the general method and apparatus can be used to calculate dielectric property estimations with the addition of a specific structure and parameters (column 22, lines 49-54). Thereby, Zaretsky teaches this required structure and required parameters for applying the method of Goldfine for a dielectrometer structure rather than only a magnetometer structure in order to achieve desired frequency responses and property estimations over a wide range of heterogeneous media (abstract and page 900, column 1, paragraph 1).

11. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Goldfine et al. in view of Zaretsky et al. and further in view of U.S. Patent No. 5,394,084 to Snyder.

As noted above, the invention of Goldfine and Zaretsky teaches all the features of the claimed invention except for specifying that the operating parameters include that of single or multiple shims of known property and geometry.

Snyder teaches a method and apparatus for reducing errors in eddy-current conductivity measurements due to lift-off by interpolating between a plurality of reference conductivity measurements (abstract). Snyder also teaches a well-known method for providing a predetermined degree of lift-off using a shim with non-conductive properties and with known geometry (column 5, lines 43-51).

It would have been obvious to one having ordinary skill in the art to modify the invention of Goldfine and Zaretsky to include specifying that the operating parameters include that of single or multiple shims of known property and geometry, as taught by Snyder, because the invention of Goldfine and Zaretsky does teach specifically defining a geometric property of a particular range to provide a desired air-gap caused by lift-off (Goldfine, column 26, line 66 to column 27, line 7) and Snyder suggests a corresponding device that would provide that desired air-gap with a dimension in that desired range, without intruding on other aspects of operation through conduction (column 5, lines 43-51).

12. Claims 11 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goldfine et al. in view of Zaretsky et al. and further in view of U.S. Patent No. 5,223,796 to Waldman et al.

As noted above, the invention of Goldfine and Zaretsky teaches all of the features of the claimed invention except for specifying that the operating point parameters are temperature dependent and variations in the temperature are used to alter the operating point or specifying that the material be monitored in an on-line configuration as part of a quality control process.

Waldman teaches apparatus and methods for measuring the dielectric and geometric properties of a material under test with operating parameters of the material under test affecting the monitored signal (column 7, lines 20-27) comprising specifying the configuration, properties, and geometry of testing electrodes (column 8, lines 27-66 and column 9, lines 37-53) and including a temperature sensor that measures the temperature of the material under test in order to compensate the measured operating parameters of the material under test (column 11, lines 23-34). Waldman also teaches plotting and adjusting measured parameters using property curves (column 15, lines 49-66) and generating a continuum model using defined matrices (column 16, lines 40-67). Further, Waldman teaches sending measured results to a remote computer for online quality control (column 11, lines 14-22).

It would have been obvious to one having ordinary skill in the art to modify the invention of Goldfine and Zaretsky to include specifying that the operating point parameters are temperature dependent and variations in the temperature are used

to alter the operating point and specifying that the material be monitored in an on-line configuration as part of a quality control process, as taught by Waldman, because Waldman suggests that the combination would have produced a higher degree of accuracy by compensating for variations caused by temperature (column 11, lines 23-34) as well as allowed the user of the method to obtain desired results by monitoring the results continuously and making changes accordingly to maintain the necessary output (column 11, lines 14-22).

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent No. 5,426,373 to Diamond et al. teaches a two-electrode device for determining electrical properties of a material on a metal substratum.

U.S. Patent No. 5,059,902 to Linder teaches an electromagnetic method and system using voltage induced by a decaying magnetic field to determine characteristics, including distance, dimensions, conductivity and temperature of an electrically conductive material.

U.S. Patent No. 4,814,690 to Melcher et al. teaches an apparatus and method for measuring permittivity in materials.

U.S. Patent No. 5,654,643 to Bechtel et al. teaches a dielectric sensor apparatus.

Sadiku, "Elements of Electromagnetics" teaches the relationship between magnetic fields and electric fields.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey R. West whose telephone number is (703)308-1309. The examiner can normally be reached on Monday through Friday, 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marc S. Hoff can be reached on (703)308-1677. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-7382 for regular communications and (703)308-7382 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

jrw
June 30, 2003

Marc S. Hoff
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